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The Surgical Pathology of Canker and Some Remarks on its Treatment.*

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I have purposely limited the scope of my paper, as the time at my disposal this morning is short, and as the condition is one familiar to you all I will be serving the interests of the discussion best by being brief.

There is a great danger of our looking at the end results of disease and overlooking the series of events which lead up to such, the observation of which is the great rôle of the general practitioner in fathoming the obscure problems of disease.

It is here that the general practitioner, with his observation of disease processes from day to day, together with experience, has an outlook so much more wide than the laboratory-trained man, who depends so much upon mechanical devices for observing and recording his results.

Both the clinical observer and the laboratory-trained man, be he pathologist, bacteriologist, parasitologist, or one of the many other specialists, are, however, corollary factors in the study of problems connected with our calling.

It is with the interpretation of the disease process in Canker and its bearing upon treatment that I wish to direct your attention for a short time.

SURGICAL ANATOMY.

In order to make what I have to say intelligible, let me remind you that if the hoof of a healthy horse is forcibly removed there are left, covering the extremity of the limb, cells (germinative cells or deepest part of the *rete mucosum*) capable of regenerating completely a new hoof.

The hoof corresponds to the epidermis of the skin, and just as the epidermis is nourished by a strong vascular tissue, the *cutis vera*, so the hoof is nourished by a similar structure, the matrix of the hoof.

In the case of the *cutis vera* of the skin, it lies on a loose subcutaneous tissue, but the matrix of the hoof has no corresponding loose attachment to underlying tissues, it blending closely with the periosteum covering the terminal phalanx, the lateral cartilages, and the digital torus.

The matrix of the hoof consists of very dense vascular connective tissue, carrying delicate papillæ or laminæ of the same structure, this matrix receiving various names—solar matrix, furcal matrix, laminal matrix, coronary matrix, and marginal matrix, but the essentials for the regeneration of the particular parts of the hoof depend on the presence of young germinative epithelial cells which cover the matrix.

So long as the matrix, with its attached germinative epithelium is not affected by a disease-process, these germinative cells are capable of producing fully keratinised tough healthy horn within two or three days, though the layer of horn will naturally in such a short time be quite thin.

Large areas of matrix can have the germinative cells completely removed, and in such cases regeneration of the horn takes place in exactly the same way as epidermis covers a granulating wound involving the skin and deeper structures. From experience I should say the rate of regeneration is best over solar and furcal matrix, less so over laminal matrix, and only very slight in the case of coronary matrix.

The germinative cells attached to the matrix form only a microscopic layer when a hoof or a portion of hoof is forcibly removed, so that on looking at such a foot with the naked eye we see a red fleshy membrane. The hoof itself consists of keratinised epithelial cells which are so tough and insensitive as normally to protect the underlying tissues from external infections.

Definition of Canker.

Briefly stated, canker is a progressive necrosis of newly formed cells, arising from the germinative layer of the hoof with a chronic inflammation of the underlying matrix.

Etiology—Predisposing Causes.

It is a well-recognised fact that canker is not met with in stables where foot hygiene is attended to, but rather among heavy horses, more particularly farm horses, and the advanced state in which so many cases are first seen by us simply shows how little attention is paid to the cleaning and examination of the feet.

Another factor which stands out in the series of cases I have met in the last four years is the neglect by some blacksmiths in reducing the feet of horses when re-shoeing, particularly at the heels, so that deep clefts occur between the infected parts of the wall and the frog, and also in the centre of the frog, which simply act as traps for fermenting filth teeming with organisms. Not only is the overgrowth of the wall and frog allowed to go on, but the sole also is overgrown, so that a very definite cleft often encircles the point of the frog.

* Presented to the Scottish Branch at Perth, on June 6th, 1924.

In the vast majority of cases which are seen early, some part of these clefts related to the frog shows on close examination a break in the continuity of the horn and commencing disease. I have yet to meet the case which, in my opinion, has started elsewhere than in relation to the clefts of the frog.

In addition to the fact that these clefts accumulate and retain filth in a moist state, providing ideal conditions for the growth of organisms, these are the parts of the foot where the soft tissues are least protected.

When a foot is overgrown, there is never the same increase of horn growth at the bottom of the lateral clefts, the abrupt termination from one type of horn to another leaving, as it were, a line of weakness. The weakness in the central cleft of the frog may be due to the fact that opening into the depths of the cleft are the ducts of glands which lie in the digital torus which give ready access to infection, as is evident by the ease with which neglect will lead to the well-known condition of " Thrush."

Exciting Cause.

From a study of a number of cases, I came to the conclusion that casual examination of swabs or material taken from a case of canker as first presented to one before any operation, would be fallacious, because the ragged ulcerating surface of such a foot has been exposed to contamination with the ground and would naturally present all manner of organisms, many of which would have nothing to do with the disease-process. I contend that material, to be of any value, should be taken at the very border of the advancing disease-process, where the border line is protected from external contamination by a layer of unexfoliated horn.

In a recent case I took a piece of tissue from such a border line, after stripping a portion of wall with a good margin on the side of healthy laminal matrix, removing it with sterile knife and forceps and sending it for bacterial examination to my colleague, Professor Matheson. The following is the report of the organisms found: *Bacillus necrosis*, *Streptococcus pyogenes*, *Micrococcus pyogenes*, *Proteus vulgaris*, and a number of indeterminate forms. From this it will be observed that in this particular case, infection was very mixed, and it will be interesting to see whether in future observations of material taken with similar care, the flora is similar.

It is too early to come to a definite conclusion regarding the causative organism, but I cannot help thinking that the clinical picture of the progress of the disease shows a close resemblance to the action of the *B. necrosis* in other conditions, *e.g.*, necrotic stomatitis in calves and foot-rot in sheep, etc.

Surgical Pathology.

In most cases of damage to the hoof involving the underlying soft tissues, the reaction to infection is acute, with the formation of a purulent discharge which, if not evacuated, may lead to such a condition as an under-run sole which may break out at the heels or coronet and do other damage. Such a train of symptoms follows a picked-up nail or prick in shoeing.

Canker appears to start as a result of a solution of the protective horn in those selective positions in relation to the frog already mentioned, permitting infection to gain entry to the matrix and start a chronic inflammation. The essential feature of the disease-process, once it has been started, is that it creeps outward from the original seat of infection in the young germinative epithelium, so that the strong horn already formed may for a long time hide its ramifications.

As time goes on and the disease gradually spreads over the matrix, the horn first separated from the underlying matrix, near the primary origin of infection, becomes exfoliated and leaves larger and larger areas of inflamed exposed matrix. The irregular outline of the advancing disease is well seen if a large portion of sound horn is cut through so as to encircle the obvious clinical lesion and then forcibly stripped off, there often being narrow prong-like areas of diseased matrix, grey in colour, running into healthy matrix, red in colour. This is particularly well seen when the laminal matrix is affected.

In the early stages the disease appears to be chiefly a surface one of the matrix, the grey appearance of the diseased matrix being due to a caseous layer of necrotic cells, but where it is of longest standing the infection encroaches in depth on the underlying vascular matrix, thus explaining the difficulty experienced with certain isolated areas when the bulk of the superficial disease area has quickly yielded to treatment.

The chronic nature of the inflammation leads to marked overgrowth of the normal delicate papillæ of the matrix as soon as the overlying detached horn has exfoliated, so that they grow to a great length, and in doing so imprison between them organisms which keep up the chronic inflammation in the depths of the matrix. These overgrown papillæ become matted together by masses of young epithelial cells, which occasionally, towards the end of the fungoid masses of matted papillæ, develop to form horn, but as the bases of the papillæ are still involved in the chronic inflammation they remain like islands thrown up from an underlying quicksand.

Microscopically this chronic inflamed matrix shows:

(1) Hypertrophied connective tissue papillæ with dilated capillaries.

(2) A few wandering leucocytes.

(3) Uniting the papillæ soft large epithelial cells with nuclei in various stages of fragmentation.

(4) Clumps of organisms of various kinds.

Where the disease is most active the epithelial cells break down more quickly, and together with leucocytes and serum-exudated from the engorged capillaries give rise to the characteristic grey fœtid discharge.

Treatment.

I do not intend to discuss all the various treatments which have been tried in canker, for they are legion, which merely goes to prove that there is no one

method which in the hands of all will invariably be successful.

If, however, one glances over all the various treatments which have been advanced, it will be seen that they all have one thing in common, and that is that some agent is always employed which is destructive of organisms, ranging from the actual cautery to mild antiseptics. The whole secret in the treatment of canker is the success with which the germicidal agent is brought into contact with the organisms which keep up the chronic inflammation, and as soon as these are destroyed the germinative epithelium of the matrix will form sound horn.

Keeping in mind the nature of the disease-process the chief factors which make it difficult to get at the infecting organisms are two:

(1) Considerable parts of the diseased matrix may still be covered by a variable quantity of apparently sound attached horn.

(2) The part or parts of the matrix which have long been affected with the disease have become deeply infected and become hypertrophied.

In order to meet these difficulties the method I employ at the very beginning of treatment of a case is a radical operation under a general anæsthetic.

The broad outlines of the operation are:

(*a*) Reduce the wall to normal length.

(*b*) Estimate approximately the limits of the disease affecting the sole and frog, and be prepared to remove the whole of these if necessary. In some cases it is not necessary to remove the whole sole if the disease is limited to one half of the foot. Cut a groove through the sound horn beyond the estimated limits of the disease with a searcher until only a thin layer of healthy horn covers the matrix, taking care to have a bevelled edge on the horn which is to remain. If the inflected part of the wall bar is also involved, this is cut through close up to the buttress. In this way the diseased area is encircled.

If the laminal matrix of the wall is affected I think this method of detaching a portion of wall going beyond the limits of the disease is ideal, because here the advancing border is often very irregular. Sometimes this necessitates removal of the whole wall at a quarter, at other times a semi-circular piece at the toe or elsewhere, the size depending upon the extent of the disease process.

(*c*) At this stage a general anæsthetic is given and tourniquets applied below the knee or hock and sometimes a light tourniquet is also placed in the hollow of the heel.

(*d*) The thin layer of horn covering the matrix at the bottom of the groove is then cut through with a scalpel and a strong thin steel lever is inserted and the encircled portion of hoof prised up until it can be grasped by pincers, with which it is gradually torn off.

The limits of the diseased matrix are now definitely visible, the diseased matrix being grey in marked contrast to the red healthy matrix. If there are slender finger-like processes of grey diseased matrix still running under the horn, it will be necessary to remove more horn, and it is safer to tear off a further portion rather than pare away the edge of the horn, so that no diseased focus may be left which may serve as a fresh starting point for a further spread.

(*e*) The next step is the reduction of the overgrown matrix of sole and frog, which I do by means of sage knives, aiming at cutting down the overgrown papillæ almost to their bases, so that the previously ragged looking foot comes to have the regular outlines of a healthy foot with the hoof detached. When the diseased matrix is not much hypertrophied as near the spreading margin of solar matrix and when the laminal matrix of the wall is affected, I curette it lightly so as to mechanically remove the caseous necrotic material.

Special deep curetting is generally required in the angle between the frog and sole matrix and also in the central cleft of the frog to get as near the healthy layer of the matrix as possible, and I do not mind if at these parts the whole of the germinative layer covering the matrix is removed, as regeneration of epithelium will take place over healthy granulation tissue later.

It is these places where infection has passed deepest into the tissues and therefore are the most difficult to get to heal.

(*f*) Next I have a shoe applied to the foot, the object of which is to permit of an iron sole being fitted which is easily detachable to permit of subsequent dressing of the foot.

(*g*) The first dressing consists of two or three layers of gauze soaked in eusol, together with absorbent wool, sufficient to pack the space between the foot and the iron plate fairly tight for the purpose of controlling hæmorrhage. If it has been necessary to remove part of the wall a calico bandage over a similar dressing is put round the foot.

For three or four hours after operation a light tourniquet is kept on over a flannel bandage, below the knee or hock, and by this time hæmorrhage has stopped.

After Treatment.

The first dressings are removed two days after operation, and any clots gently cleared away. Subsequent dressings consists of wet dressings of acriflavin, 1—1000, maintained in contact with the foot by light packings. Daily dressings are preferable, and as such a dressing as the above is non-irritant, horses become quite quiet and easy to dress after a few days, when the initial pain of the operation has subsided.

The bulk of the dressed matrix usually quickly takes on a healthy character and forms healthy horn with no further necrosis, but in bad cases of long standing, infection has got so deeply into the vascular matrix in certain places that occasional light curetting is required to get continued action of the antiseptic. Such places are made evident by typical liquefying necrosis.

Conclusions.

Canker appears to result from infection gaining entrance by some break in the continuity of the hoof.

This infection sets up a progressive necrosis of young cells arising from the germinative epithelium covering the matrix, but does not, as a rule, destroy completely the germinative layer, as under appropriate antiseptic treatment infection can be destroyed and healthy horn reforms.

The vascular matrix reacts to the irritation of infection by becoming hypertrophied but not necrotic.

Infection is of a very mixed nature, the bacillus of necrosis probably being the chief organism, but further investigation of cases, taking material from the encroaching border of the disease-process is suggested.

The limits of the disease are best defined by a primary radical operation so as to leave the diseased matrix sharply contrasted with the neighbouring healthy matrix.

Hypertrophied matrix is reduced by surgical means, so that the configuration of the foot resembles that of a healthy foot with the horn removed over a similar area.

After removal of the bulk of the infected tissue, simple antiseptics are able to kill remaining organisms and are non-irritant to the horse.

Discussion.

Mr. Spruell, Dundee, who opened the discussion, mentioned at the outset that he had recently found a rather interesting old book written by Gervaise Markham, in 1630—in the reign of Charles I. He was Master of the Horse for the King, and he spoke of "the running of rotten frush." The description was that of canker. Mr. Spruell read extracts from the book, giving Gervaise Markham's treatment of the ailment, which, it was interesting to note, included the original alum cure. He also quoted from a letter written to his father in 1890 by Mr. Hunting, in which an operation for canker was described, exactly like Professor Mitchell's, and which was performed by John Lawson, junior, Manchester. He thought that, boiled down, the treatment of canker consisted in perseverance and Scottish pigheadedness, not to be beaten. The first thing to look into was the value of the subject. There was also, perhaps, the value of the client as a secondary consideration (Laughter). Then there was the question of the place where the horse was housed, because it was important for the practitioner, in tackling canker, certainly in its first stages, to have the animal sent to a forge. He believed in removing all little islands of horn that had grown on apparently healed parts and levelling the whole thing down to the normal foot. Personally he used nitric acid and Archangel tar. The mixture produced a fuming mass which he applied absolutely boiling hot. He certainly thought that killed most of the bacteria. Eusol was very largely used in France for the simple reason that the Army veterinary chest contained little else and when they got canker in the first stage, the eusol dressings in many cases did very well.

Mr. Inglis, Forfar, said that, coming from a country district, he was very well satisfied with the paper which had been read by Professor Mitchell, who had treated the subject in a most instructive manner. It was all very well to give laboratory treatment, but the difficulty they had as practitioners was the patience of their clients. Of course it depended a good deal on the value of the horse before an attempt was made with treatment such as had been described. It was expensive, troublesome, and required a good deal of personal attention. He thought more attention could be given to the prevention of canker. They knew canker was the result of neglect. In the country there was little or no attention given to the feet of the farm horse. He blamed the farmer as much as the farm servant. Blacksmiths often reported through the farm servant that a horse's foot required attention, but as a rule nothing was done until it got beyond the possibility of response to ordinary treatment.

Mr. John Taylor, Edinburgh, remarked that he very seldom saw canker in the city, because he shod the horses and his men always reported any suspicion of canker. It was really in country horses that they got all the trouble, due largely to the high cost of shoeing and the farmer not sending his horses so regularly to the forge as he should, also the smith was often far too lazy and did not cut the horse's foot down properly. As regarded treatment, he believed in applying plenty of pressure. At one time, he used the late Mr. Rutherford's treatment. He (Mr. Taylor) had now given up Mr. Rutherford's dressing and was using W. R. Davis's dressing. He had a recent case which had been absolutely cured with this dressing. During the war, the Davis dressing went distinctly off and he could not make out what was wrong. He wrote to Mr. Davis and learnt that he had difficulty in getting glycerine. He understood that glycerine was the basis of the Davis dressing, which he would not now change for any other, combined with pressure and keeping the horse working. As Mr. Spreull had said, they had always to consider whether the horse was worth treatment.

Mr. Gofton found himself in agreement with most of Professor Mitchell's opinions, but he differed from him a little in some of the details. He thought some caution was necessary before any conclusion was reached that the bacillus of necrosis had any causal relationship to canker. Lesions which were known to be caused by the bacillus of necrosis in other situations differed from those of canker. The latter condition appeared to be a morbid process affecting the epithelial structures only and did not involve the deeper structures of the foot, except in so far as a sub-acute or chronic inflammatory action occurred in them. In other situations the action of the bacillus of necrosis was not confined to the epithelial structures, but involved the underlying tissues, which also underwent necrosis as the result of the action of the bacillus. He thought, for these reasons, that the relationship of *Bacillus necrosis* to canker required further investigation before any conclusion was reached.

In regard to treatment, it saved time in the long run to spend half a day, if necessary, in order to expose the whole of the diseased surface of the foot as the first step in treatment. He believed, however, in the gradual removal of the horn rather than in Professor Mitchell's method of isolating a large area of horn and its removal in one mass. The result in the end was the same, but he preferred the gradual method as being conservative of sound tissue whilst exposing the whole of the diseased structure. He did not believe in removing the wall, but in preserving it as far as practicable, since he regarded it as of great value for retaining dressings in position and for holding the shoe. He preferred a pair of good blunt pointed scissors to the curette for removing the fungoid masses and enlarged villæ. They could be better controlled than the curette, were more conservative and more efficient for accomplishing what was desired. As far as dressings were concerned, he was of opinion that an antiseptic, preferably non-irritant in character, was the only dressing required. Frequent dressings were unnecessary. The first dressing, if properly applied, need not be touched for a week. The whole foot should then be carefully inspected in order to ensure that the limits of the diseased surface had been fully exposed, and he found in the majority of cases that weekly dressings for three weeks and subsequently at intervals of a fortnight were all that was required. He thought lack of progress towards recovery in any case was due to failure completely to expose the whole of the diseased surface of the foot.

Mr. BROWN, Perth, said that in his younger days this was a disease only found in town practice, but now it was much more common in the country. The cause was neglect, and he always advised when treating a foot that it was well to attend to the other feet at the same time to see that nothing was wrong. He had often found before one affected foot was cured that the disease had started in another. As to treatment, the disease was no doubt caused by an organism, and antiseptics were essential. A great number of the cases he had seen were prejudiced by being treated with too strong remedies, which caused necrosis and lameness. He did not think it was necessary to use such strong dressings. He noticed in some of the American journals that good results were claimed from the internal administration of arsenic, and he would like to hear other opinions about it. He had tried it, but he could not say he had very good results from it.

Mr. NAIRN, Blairgowrie, agreed with Professor Mitchell that the treatment resolved itself into the removal of unhealthy horn and application of antiseptic dressings. He had used formalin and he had had success with it. In a country practice they did not possess the conditions for treatment which were available in a hospital, but he dressed once a week to begin with and later once a fortnight, and, in the bulk of cases, he had no serious trouble. Mr. Gofton had mentioned a case where the disease affected the whole wall, right round. When he met a case like that he sent it to the knackery. He agreed with what had been said with regard to prevention. In country practices canker was more prevalent to-day than it was twenty years ago and that was due partly to the high cost of shoeing and the greed of the client in his anxiety to have as small a blacksmith's account as possible. In parts of his district, horses were sent to the forge once a year only and possibly that accounted for many cases of canker. Professor Mitchell had certainly indicated the correct scientific lines of treatment and he agreed with them, but he found he had to modify the treatment in a country practice.

Mr. HOWIE, Alford, said he had had success in the treatment of canker, mostly due to one particular item in the prescription Professor Mitchell had given them, and that was perseverance. When cases were got early, he found it quite possible to treat canker and keep the horses working. As regards W. R. Davis's dressing, he had used it and thought a lot of it. It was simple and harmless to instruments and fingers in handling, and if applied strictly according to directions, it gave a perfect cure. There was one point about Davis's remedy, they got on splendidly up to a certain stage and then the effect seemed to stop in some cases. He thought that was due in many cases to too much pressure, which set up a kind of necrosis and caused lameness. He found that when the pressure was removed the recovery proceeded. In too much pressure there was a danger of destroying underlying sensitive structures of the foot.

Mr. J. DONALDSON POTTIE, Greenock, said he must support what was said about the Davis treatment. It was a very good lotion up to a point, but it did not do where there was too much pressure on the foot. They found that canker was due as a rule to a bad thrush or greasy leg. He had no doubt canker was a disease of the epithelial cells and not of the deep structures at all, and once they got these cells clear of the disease, recovery followed. The question usually was, however, How long are you to take to cure it, and how much money will it cost? Perseverance was all right if they had their client with them. He believed they could cure without any antiseptic at all, provided they got proper pressure. The Davis lotion, he believed, contained glycerine and a good deal of nitric acid.

Professor MITCHELL, in reply to the discussion, said there was one point which had been referred to by several of the speakers—that was the tackling of the disease to begin with. Some of the speakers talked of paring away and gradually approaching the border of the disease, by what he called a nibbling process. He entirely disagreed with that, because he thought it was much more rational to expose the whole of the diseased matrix by the method suggested in his paper, so that they saw at the outset how far the disease extended. When they exposed the matrix they would get new, sound, firm horn within two or three days, when the matrix was not diseased.

With regard to mild antiseptics and crude antiseptics, he was very careful to say at the beginning

of his paper, that what in the hands of one gave success, might not do so in the hands of another. Personally, he did not like these strong dressings for various reasons. Nitric acid, tar, formalin, and so on would certainly kill organisms, but they would also kill healthy tissue, and it was very difficult to judge where these caustics and corrosives stopped in their action. He recently had a case which had been treated for some months with a crude dressing before it came into his hands. The result was that not only had the matrix been destroyed, but the bone was burned, which led to a sequestrum requiring operative interference for its removal. All these crude dressings were also very painful for the animal, whose feelings should be considered.

As regards prevention, he thought that one of the soundest things he had heard during the discussion was that the disease could be prevented if farmers only realised the necessity for looking after their horses' feet.

As to the causal factor, he hoped Mr. Gofton had not led them to think that he had stated that the *Bacillus necrosis* was the cause of the disease. He had particularly said that it was suggested to be the cause, but that further investigation was required.

He thanked Mr. Gofton for the suggestion about the dressing scissors, but he could not see that it would help him very much. He had a foot at the college at present, of which, if they took dressing scissors to it, they would simply make a recess—it would not be surgery. A curette was the only thing that could bottom overgrown matrix satisfactorily.

As to the application of dressings, he quite agreed about applying them once a week if they had not time to put them on oftener, but he held that if they put on a fresh simple dressing oftener they got the better of the canker, because it would be a surface dressing and was going to be used up in the destruction of organisms, or its further action prevented by a layer of dead tissue. Though he quite realised thedifficulty of time, he preferred a simple dressing which, with instruction, the ordinary farm hand could apply with safety, and which would certainly not be the case when corrosives were left to be applied. Formalin was a wonderful antiseptic, he admitted, and no doubt would kill the organisms, but he did not like it because of its irritant qualities. Mr. Howie had referred to the question of hæmorrhage produced in exposing the border of the disease. Referring to the late Mr. Malcolm's treatment, which he knew was probably mostly used up to a few years ago, the objection he had to the method was having to return again and again to take away horn, which showed that the disease was still present at the border, whereas, if the border had been fully exposed to begin with, in a few days they would have a thin layer of horn over any exposed healthy matrix and they would have no trouble on account of any unexposed diseased matrix.

He never used pressure and he always employed mild antiseptics, so that the question of treatment of canker was not always wholly one of pressure or antiseptics.

Photography of the Invisible.

Under the above heading the scientific correspondent of *The Times* contributes to his paper the following interesting communication on the application of ultra-microscopic photography to the problem of the discovery of the causative organisms of disease:—

"Two Dutch investigators, Professors Paul Frosch and H. Dahmen, have succeeded in isolating the virus of foot-and-mouth disease, the virulent contagious malady of cattle which in recent years has broken through our protective cordon and threatened economic disaster to the stock-raising industry of this country. It has long been accepted that the causative agent of this plague must be a living organism capable of surviving outside the body of cattle for a sufficient time to spread by unknown ways. It has been equally clear, however, that it belonged to the little-known group of 'filter-passers,' organisms so minute as to be inseparable from a liquid containing them by a Pasteur filter.

"The identification of a living virus and the possibility of making a pure culture from it are almost essential stages in developing methods of protection or of cure. In the absence of such exact knowledge the means of the transference of infection and the efficacy of treatment by sera or by drugs can only be empirical guesswork. The Dutch professors now have not only isolated the virus, but have been able to make pure cultures of it on solid media. Thus the first stage towards conquest of the disease has been reached. The method they have employed has been the use of the ultra-microscope and the taking of photographs by light-rays beyond the range of visibility. There can be little doubt that they have shown the way towards a method of research of the utmost value in many obscure diseases.

"Many of the objects which have to be investigated by biologists are almost invisible under the microscope, either because of their minute size or because they have almost the same refractive index as the fluids in which they are examined. One device for overcoming this difficulty is the use of pigments or other chemicals chosen so as to produce differentiating effects on the objects in the microscopic field. Another method, sometimes erroneously described as 'ultra-microscopic,' is the use of a dark background with strong lateral illumination. It was by this method that Metchnikov and his associates first made visible the transparent spiral organism of syphilis.

"Dust particles, completely invisible under ordinary light, become clearly visible in a beam of sunlight, as we have all seen when a ray passes through a chink in the shutters of a darkened room. The late Lord Rayleigh was the real inventor of ultra-microscopy when, in 1899, he showed that only sufficiently intense illumination was required to make visible a particle too small to be seen by the highest power of the microscope. The wave lengths of the visible parts of the spectrum lie approximately between 700 and 400 'microns' (millionths of a metre), and any object smaller than about half the wave length of the light by which it is illuminated cannot be seen in its true form and size because of diffraction. Very much smaller particles, however, can be made visible in the form of diffraction images larger in size and different in shape by

being observed in a powerful beam of light sent through the solution containing them at right angles to the axis of the microscope. The first satisfactory assemblage of apparatus for this purpose was contrived by Siedentopf and Zsigmony early this century, and modifications and adaptations of this are sold by various optical firms.

"The ultra-microscope can be used to detect the presence and estimate the quantities of particles in a fluid which otherwise would be invisible. It is possible even by elaborate calculation to estimate the true size of the particles. But a still more interesting step was made in 1904 by Köhler, who took photographs by using the short waves of ultra-violet light. Certain structures in cells and apparently some of the 'filter-passers' are transparent to all visible wave lengths of light, but are more or less opaque to ultra-violet rays to which the photographic plate is sensitive. It is this method, hitherto little used because of the complexity of the apparatus required, that Frosch and Dahmen have now developed. Frosch used an ultra-microscope constructed at Jena by Köhler. He obtained the ultra-violet light by burning cadmium in a high-tension electric spark. The cadmium light, passed through a quartz prism, formed a spectrum with a narrow zone of visible light in the yellow and green-blue parts and a very wide zone in the invisible ultra-violet region. These invisible rays were focussed by a lens of quartz glass and conducted to the ultra-microscope.

"As the light was invisible, the ordinary methods of focussing could not be employed, and success was obtained only by making a long series of trials until the proper adjustment was reached by the method of trial and error. According to the Dutch correspondent of the *Lancet*, satisfactory results were obtained first with the causative organism of pleuro-pneumonia, which was found to be not one of the bacteria, but a yeast-like organism propagating by budding.

"The virus of foot-and-mouth disease, grown on a solid medium, gave rise to colonies from seven to eight microns in diameter. With high magnification and the use of light of the shortest possible wave length, it was found possible to get photographs of individuals of the organism, which proved to be bacteria with an estimated length of about one-tenth of a micron. Sub-cultures to the 26th generation have been obtained and proved to retain their virulence.

"Knowledge of the nature and cause of a disease is not necessarily immediately followed by the discovery of a cure, but it is a great advance towards it, and the Dutch success should lighten the work of Sir Charles Sherrington's committee on foot-and-mouth disease."

The Rôle of Agricultural Committees.

The following is extracted from a letter addressed to Local Authorities by the Minister of Agriculture :—

5th June, 1924.

"I am directed by the Minister of Agriculture and Fisheries to inform you that he has had under consideration the question whether the Agricultural Committees of the County Councils might not with advantage play a larger part in the agricultural development of the country than has hitherto been the case.

"It will be within the knowledge of your Committee that the Agricultural Committees were established by the Ministry of Agriculture and Fisheries Act, 1919, on the recommendation of Lord Selborne's Committee on Agricultural Policy, to administer the powers of control of cultivation which were contained in the Corn Production Acts and to co-ordinate all the agricultural work for which the County Councils were responsible, such as the provision of small holdings, the local administration of the Diseases of Animals Acts, and, if the County Council so decided, the responsibility for agricultural education. The Committees were also made the constituent bodies for the appointment of a majority of the Councils of Agriculture for England and for Wales.

"The repeal of the Corn Production Acts has undoubtedly had a detrimental effect on the interests and activities of the Committees, so much so that representations have been made to the Ministry from several counties that in the altered circumstances the Agricultural Committees cannot be of any practical use and should be abolished. This proposal, however, appears to the Minister to ignore one of the main reasons for the establishment of these Committees. It would have been, and would now be, a great mistake if the recognised organisation of local government did not include a regularly constituted body competent and empowered to speak for agriculture in each county. That consideration still holds good and justifies the maintenance of the Agricultural Committees. The right course is to consider how they can be made of more service both to the industry of agriculture and to the nation as a whole. The position is that instead of the Committees being the policemen of agriculture, they must rely on the arts of persuasion, education and example.

"It is clear that no drastic measures which would arouse acute political controversy are practicable, and accordingly agriculture must aim at the improvement both of men and of methods, and the avoidance of waste if success is to be attained; for these purposes education in the broadest sense of the word will be the most effective agent. How many farmers avail themselves sufficiently of the practical advice and assistance that they can obtain from the County Agricultural Organiser, from the Horticultural Dairy or Poultry Officers, or from the Agricultural Colleges or the Advisory Officers attached to them? Again, how small in comparison to the total are the numbers of those who have even once paid a visit to one of the great research institutions, and how few there are comparatively who are taking full educational advantage of the valuable schemes for the improvement of livestock. The Ministry endeavours to make known these and other educational facilities by leaflets and by its Journal; but members of Agricultural Committees responsible for agricultural education might well consider whether they could not do more both collectively and individually to spread this knowledge. In particular, members of Agricultural Committees have a special responsibility for the statutory small holders and allotment holders who have been established under the Small Holdings and Allotments Acts. It is specially desirable in their case to see that all possible assistance is given to them by the Organisers and Instructors on the County Agricultural staff, and it is

suggested that the Small Holdings Sub-Committee should give special consideration to this question in consultation with the Committee responsible for agricultural education.

"It would also be worth while to make much more use of the columns of the local press in order to obtain publicity for the lessons which research and education can teach. Even in counties where agricultural education is not under the control of the Agricultural Committee, much might be done if every member of a Committee made it his business, first, to acquaint himself with the available assistance and advice which can be obtained by agriculturists in his county and, secondly, to spread information on the subject among his friends and neighbours. The Minister cannot suppose that such individual assistance would be met by the Committee administering agricultural education with anything but a cordial welcome. It is not sufficient to leave this kind of propaganda to the Ministry. Farmers will often pay more attention to those who are well known to them in their own locality than to any Government Department or official, and it would be of enormous assistance if every Agricultural Committee would do its utmost (as an official body where it controls agricultural education, as individuals where agricultural education is administered by another Committee) to bring home to every farmer in its county the opportunity and facilities provided through the county staffs and Agricultural Colleges and the Research Institutions.

"Another direction in which the Minister is of opinion that Agricultural Committees can render valuable service is by the promotion and encouragement of sound schemes for the improvement of the facilities for marketing agricultural produce, whether by co-operative organisation, by transport developments or by other means. The Ministry proposes to appoint a small staff to investigate marketing problems on the lines recommended by the Linlithgow Committee. The Minister believes also that there would be great advantage in a systematic effort to popularise and standardise British agricultural produce.

"The influence of the Committee should also have a considerable effect in raising the general standard of farming and creating a sound public opinion as to the responsibilities which the occupation of land entails. It cannot be denied that there is a growing tendency among certain sections of the industrial population to criticise adversely the manner in which some of the land of the county is being farmed and the lack of business organisation in the industry. While such criticism is not infrequently ill-formed and made with insufficient recognition of the farmer's difficulties, it is a healthy sign that the towns should take an increasing interest in agricultural problems, and it makes it all the more important that all reasonable grounds for criticism should be removed in order that the danger of hasty or unwise action in the direction of control may be avoided. Committees might therefore undertake a survey of the agricultural conditions of their county. On the other hand, it is undeniable that the best farmers in this country are unsurpassed in any part of the world, and it is desirable that publicity should be given to specially successful enterprises of the most progressive and up-to-date farmers in their area.

"Enough has been said to indicate in general terms some of the directions in which the Minister thinks that the Agricultural Committees can play a more active part in rural developments. Other methods will no doubt occur to the Committees themselves. The important thing, in the Minister's view, is that the Committees themselves should consider what methods are best adapted to their own localities and should make suggestions as to the manner in which they can most profitably advance the cause of agricultural development."

* * * *

The Ministry of Agriculture announces that in connection with the above, the Government has agreed that the sum of £60,000 shall be voted for the purposes mentioned for use in the current financial year.

Royal Army Veterinary Corps Annual Dinner.

The following is a list of the officers present at the above dinner on Friday, 20th June, 1924, at the Hotel Cecil :—

Major-General W. Dunlop Smith, C.B , C.M.G., D.S.O., presiding.

Lieut.-Gen. Sir Walter Campbell, K.C.B., K.C.M.G., D.S.O., Quarter-Master General to the Forces, was the guest of the evening.

Major-General Sir L. J. Blenkinsop, K.C.B., D.S.O., Colonel Commandant, Sir F. Smith, K.C.M.G., C.B., Sir John Moore, K.C.M.G.. C.B.

Colonels G. M. Williams, C.M.G., F. W. Wilson, C.M.G., E. E. Martin, C.M.G., C.B.E., F. W. Hunt, C.B., C.M.G., C.B.E., G. K. Walker, C.I.E., O.B.E., A. G. Todd, C.B.E., D.S.O.

Lieut.-Colonels D. Bolton, A. Olver, C.B., C.M.G., E. J. Wadley, C.B.E., D.S.O., J. W. Rainey, C.B.E., F. S. H. Baldrey, C.M.G., A. E. Clarke, W. A. McDougall, D.S.O., O.B.E., F. C. Stratton, F. D. Hunt, O.B.E., H. C. Dibben, K. McL. McKeuzie, D.S.O., J. J. B. Tapley, D.S.O.

Majors L. Danels, H. E. Gibbs, D.S.O., J. Harrison, B. A. Jarvis, A. Leaning, D.S.O., J. S. Nimmo, S. F. G. Pallin, D.S.O., W. E. Schofield, O.B.E., J. Tagg, T. G. Heatley, O.B.E., A. N. M. Swanston, T. E. Campey, M.B.E., P. J. Simpson, D.S.O., J. A. Connell, P. W. Dayer-Smith, O.B.E. R. G. Anderson, O.B.E., W. Ascott, O.B.E., C. E. Neill, H. Peele, H. C. Jagger, O.B.E , F. W. C. Drinkwater, A. Robb, F. W. Pawlett.

Captains F. J. Andrews, W. E. Barry, D. A. S. Beck, B. R. Body, E. C. Barnes, C. K. Calder, P. D. Carey, J. J. Clune, W. D. Connochie, C. Davenport, M. Farelly, C. P. Fisher, J. Going, F. B Hayes, O.B.E., C. W. Heane, T. Hodgins, F. Hogg, C. Holland, M.C., W B Horne, H. J. Hughes, M. J. Killelea, C. J. R. Lawrence, O.B.E., G. Lloyd, D.S.O., W. St.J. F. McCartney, S. W. Marriott, O.B.E., J. J. Mills, J. Mullany, B. W. J. Nicholas, S. O'Donel, M.C., E. W. S. Peatt, O.B.E., J. J. Plunkett, O.B.E., L. E. Prichard, O.B.E., S. L. Slocock, M.C., J. Smith, J. J. M. Soutar, O.B.E., C. M. Stewart, C. H. S. Townsend, O.B.E., M.C., E. Wallace, J. Southall, E B. Reynolds, O.B.E., J. F. Ives, J. C. Broad.

Lieutenants L. R. Swifte, A. J. Warburton.

The Veterinary Record.

19th July, 1924.

SERVICE IN THE MINISTRY OF AGRICULTURE.

It will be within the knowledge of most of our readers that some two years or more ago this Association, having received numerous complaints and requests for help regarding the conditions of service of veterinary surgeons in many of the Dominions and Colonies, set up a "Colonial Appointments" Committee to enquire into these matters, and to give such help and advice as it might be possible to give under the circumstances. The members of the committee were all men who had served overseas, and were conversant with the conditions upon which their advice might be sought. The more information that was obtained by the committee, the more it became evident, however, that little or nothing could be done to improve conditions and raise the rates of pay abroad until some improvement had been obtained in the conditions and pay of men in Government service at home. It was a remarkable fact and one which could not be overlooked that in almost every case enquired into the complaint was (and is) that conditions abroad were unsatisfactory, mainly owing to the low standard of pay, pensions, and general conditions of service obtaining in the Ministry of Agriculture and Fisheries. It became quite evident that the conditions of service in the Ministry of Agriculture were referred to as a standard by the Colonial Office and other departments. The committee, therefore, decided to use every effort to improve the position of the veterinary surgeon in the Ministry of Agriculture, and to this end has held many meetings, and obtained personal evidence from numerous persons who were in a position to speak with first-hand knowledge of the subject. In the meanwhile the Government set up an "Administrative Committee on Foot-and-Mouth Disease," to enquire into the cause and other aspects of the recent outbreaks of the disease, and to suggest measures for the prevention of its spread in future. The Appointments Committee of this Association thought it would be well that this Government Committee should be aware of the conditions under which members of our profession are called upon to act, and requested permission to place the evidence which had been collected upon the subject before the Administrative Committee. Permission was readily granted, and a deputation of the Association attended the committee on July 10th, and was very sympathetically received.

The deputation had no difficulty in propounding a very strong case on behalf of our members to the Ministry. The conditions of service and the pay and pensions were shown to be quite unsatisfactory and quite unworthy of a service which (in peace time at least) should be our most important and our most responsible veterinary service, and which should attract to itself the most brilliant of our young graduates. At the present time the attractions are wanting, and we cannot but wonder that any young graduate with any ambition in his soul should commit himself to a life in which so much is required of him, and so little given in return; a life in which he will have so poor a prospect for himself and his family, and in which he will have so small a chance of attaining to a good professional and social status. Except that he is not called upon to wear a peaked cap with a badge, he is recognised by the public as an "inspector," a term objectionable enough to any Briton, and to most minds placing him in the same category as inspectors of taxes, sanitary and police inspectors, and other Government minor officials. He has no regular hours of work, and may be called upon to work for fifteen or eighteen hours a day for long spells. His subsistence allowance, inadequate as it is, diminishes rapidly after the first five nights on any particular undertaking, and yet he is supposed to keep himself respectably and to always keep up a presentable appearance. He enters the service with absolutely no guarantee as to his future. He starts on two years' probation, has then to pass a qualifying examination, and "pass the doctor," all at his own expense, and in time taken out of his leave, only to be put upon a further year's probation, and then be informed that he may be appointed to the establishment *when a vacancy arises*. His pay starts at £250 per annum, with bonus, and is increased by £15 a year until he reaches the limit of £400. Beyond this, no matter how useful or brilliant he may be, he cannot go until a senior vacancy occurs. Compare the pay of a medical officer in the Ministry of Health. He starts at £600 per annum with bonus, and continues up to £1,100, although he has no administrative work. After ten years' service the veterinary officer receiving his *maximum* (£400) receives only two-thirds the *minimum* commencing salary of the medical officer, while the latter, even if he never gains promotion, must eventually get $2\frac{3}{4}$ times as much as the veterinarian. Again when reaching middle age, and probably with sons and daughters to educate, the present salaries paid do not allow of a man giving his son such an education as would fit

him for a professional life. It is the desire of every good citizen and every decent man that he should so provide for his family that his sons may have as good, or better, opportunities than he himself enjoyed. It must be a bitter thought for the servants of the Ministry that the fulfilment of this parental duty is to be denied them. Again, in respect of pensions, unless a man enter the service at the age of twenty, which of course is impossible, he cannot by any means obtain his full pension. The average age of veterinary surgeons joining the Ministry is more than twenty-seven, so that the total amount of pension can only be less than $\frac{33}{80}$ths of his salary on retirement.

Of the senior appointments, there are only five senior inspectorships carrying salaries of £500 to £700 with bonus. Our readers may easily judge for themselves what the chance of promotion is for a junior. The chance for any one man eventually gaining the highest position of C.V.O. is so remote as to be outside all calculation.

The Association wishes ardently that this should be changed. We have distinct hope that the Administrative Committee on Foot-and-Mouth Disease will issue an early report and recommend alterations which will materially benefit our branch of the service, but whether favourable results follow or not, the Association has now committed itself to carry this matter through to a successful conclusion. It only needs the personal and universal support of the profession. If every member of the profession will become a member of the Association and abide loyally by the decisions of the Council, we shall then be in a very strong position, and will command that respect and attention which has been denied to our profession in the past.

Royal College of Veterinary Surgeons.

EXAMINATIONS, JULY, 1924.

LIST OF SUCCESSFUL CANDIDATES.

LONDON :—

Class A.

*Barron, N. S.
Boughey, F. D.
*Claxton, B. A.
Cooper, W. J.
Davies, T.
De Garis, J. A.
Ede, P. J.
*Edwards, S. J.
*Gabriel, L.
Hamilton, H. P.
Heathcote, F. C.
Holman, H. H.
*Langley, E.
Messervy, E.
Mills, G. H.
Orr, A. B.
Prime, R. T. C.
*Roberts, R.
Shoshan, A.
Spanjaard, B. H.
*Webb, E. A.
*White, J. B.
†Woodrow, C. E.

* Denotes 2nd Class Honours.
† Denotes 1st Class Honours.

Class B.

Aldis, D. H.
Chamberlain, T. G.
Davies, D. J.
Dixon, A. C.
Downing, W.
Handa, B. N.
Ismail, M. M.
†Jordan, L.
Shah, S. I. A.
Shaw, J. K.
Smithers, H. E.
Stephens, E. H.
Stewart, J.
Yarrow, T. B.

Class C.

Baxter, A. J.
Fenwick, D. C.
*Hudson, J. R.
Jackson, J. C.
Jones, V. B.
*Leader, G. H.
Malkani, P. G.
Nanda, P. N.
Pembrey, C. W.
Quin, K. F.
*Rhodes, W.

Class D.

Aggarwala, A. C.
Benbow, G. R.
Bovett, E. C.
Collard, S. V.
Dartnall, M. L.
Davidson, J. C.
Godfrey, C. J. N.
Gold, T. N.
Gould, G. N.
Hay-Barclay, H.
Hill, W. R.
Holmes, B.
Howe, R. S.
McGrath, T. T.
Morris, E. G.
Parsonage, R. P.
Pollock, N. F.
Pugh, D. E.
Taylor, S.
Tazewell, E. R.
Thorne, E. P.
Wooldridge, W. R.
Wilkinson, E.

LIVERPOOL :—

Class A.

*Blakemore, F.
Cartwright, W.
Davies, B. Emlyn.
Garside, J. S.
*Macdonald, J.
Radford, W. J.
Shedlock (Miss), K. W.
Thomas, G. H.

Class B.

*Durrant, G.
Fraser, A. C.
Mullen, A. L.
Roberts (Miss), Ida Lloyd.
*Salt, J. G.
Wood, C. R.
Wiggins, R. T.

Class C.

Mills, D. W.
Morcos, Z.
Smith, A.

Class D.

Birtwistle, J.
Caldwell, A. J.
*Caldwell, H. S.
Evans, R. H.
Jones, W. O.
Nightingale, W.
Porter, C. H.
Stone, A. B. A.
Woodhead, T. W.

* Denotes 2nd Class Honours.
† Denotes 1st Class Honours.

Liverpool School of Veterinary Science.

DEGREE OF B.V.Sc.

FINAL EXAMINATION.—*Part II.* Davies, G. O., Holtum, A. W.

THIRD EXAMINATION.—*Parts I., II., and III.* Mills, D. W., with Distinction in Dietetics; Morcos, Z., with Distinction in Hygiene, Dietetics, Mat. Med. and Phar.

FIRST EXAMINATION.—*Parts I. and II.* Macdonald, J.

ABSTRACT.

The Paroxysmal Hæmoglobinuria of Horses and Cattle and of Man.

The author states that while looking through veterinary literature for another purpose, he became interested in a variously-named affection of horses. —azoturia, hæmoglobinæmia, *hæmoglobinæmia paralytica*, hæmoglobinuria, hæmoglobinuric toxæmia, lumbago and black dysuria.

"A similar disease occurs in cattle. It is a paroxysmal affection, and in this and in some other respects it seemed to share features in common with the condition described in text-books of human medicine as paroxysmal hæmoglobinuria, but in other respects it seemed to be different.

"The disease has received no satisfactory explanation and unsolved problems challenge the inquirer. Thus induced, I have given thought to the subject, and I venture here to present my ideas."

Dr. Corlette quotes Friedberger and Fröhner at length in regard to azoturia of horses, and continues:

"Cases are separated into two forms. Fröhner's 'rheumatic' hæmoglobinæmia is regarded as an inflammation of the muscles of the hind limbs produced by cold, whereby a dissolution of the muscular colouring matter (identical with hæmoglobin) and its passage into the blood takes place. Those rarer cases which are brought on by over-exertion, as they regard parenchymatous myositis, and in contradistinction to 'rheumatic' they are described as 'spontaneous' hæmoglobinæmia.

"Chill is acknowledged by the great majority of observers to be the chief cause of the disorder.

"The chief changes found *post mortem* are in the muscles and blood. The muscular changes, which are seen chiefly in the muscles of the croup and thigh, consist to the naked eye of œdematous swelling and paleness. Microscopically they show granular opaqueness, a splitting up into layers, hyaline degeneration and loss of transverse striation. Occasionally small hæmorrhagic foci are seen. The most important changes in the blood are loss of normal colour and an appearance resembling varnish or tar and no coagulation, or only slight coagnlation.

"As regards glycosuria, Law in his text-book of veterinary medicine under 'Glycosuria' remarks: Rueff and Mouquet each contribute a case occurring in paraplegia attendant on hæmoglobinuria and in which the amounts of sugar were respectively 5·85 per cent. and 1·01 per cent.

"According to Friedberger and Fröhner, hæmoglobinuria originates in cattle, as in horses, from chill. It usually occurs in cold, wet, stormy seasons, when animals are driven from sheltered quarters too early for pasture, while it does not appear if they are turned out later in the season. It may be brought on by drinking water which is too cold. This corresponds to their 'rheumatic' form. The authors quote many cases of hæmoglobinuria in draught oxen exactly similar to those occurring in working horses. It occurred practically always in oxen put to work in cold inclement weather after a period of rest in the stable. It seems that in all forms there is a degenerative change found in the muscles and especially in the buttock, psoas, thigh and shoulder muscles." . . .

Catalase.

The author proceeds to deal with catalase, an enzyme upon which there has grown up in the past twenty-three years a copious literature, making use principally of the work of W. E. Burge and his associates. Burge has made a special and prolonged study of catalase and has produced a very large number of papers thereon.

"Catalase is found in all actively metabolic tissues of plants and animals, from the lowest to the highest, from bacteria (anærobes excepted) to man, and evidently plays an important part in the activity of organised life. Its particular enzymic rôle consists in the decomposition of peroxide of hydrogen with liberation of nascent oxygen. It is obvious that it is intimately concerned with tissue oxidations. 'It seems probable that in some way the catalase assists in furnishing oxygen to the tissues as fast as they require it.' According to W. E. Burge and A. J. Neill, it is issued to the systemic circulation from the liver, where it is principally formed, though it is also formed in the gastric and intestinal mucosa, and perhaps also in the pancreas and spleen. The liver is very rich in catalase, and according to W. E. Burge the catalase content of the blood can be increased by electrical stimulation of the splanchnic nerves distributed to the liver. J. Kennedy and W. E. Burge found that in depancreatised dogs the catalase content of the liver was decreased by about 75 per cent., resulting in a decreased output of catalase into the blood. They suggested that this might mean that the pancreas gives off an internal secretion which is carried to the liver and increases the formation of catalase in this organ. Of course this is not the only possible explanation. Catalase is destroyed (like the oxidases) in the processes associated with its activity, and is therefore constantly disappearing at the seat of oxidation. It appears that this destruction is wrought by the nascent oxygen which the catalase itself produces. Nascent oxygen, however, is not merely destructive to catalase. It is able to destroy all the ordinary enzymes, as is shown, amongst others, by W. E. Burge and E. L. Burge, using platinum black. . . .

"W. E. Burge supplies us with further important data. He gives his conclusions as follows:—

1. The amount of catalase in the different muscles of the body varies with the amount of work done by these muscles; those doing the greatest amount of work contain most catalase, while the muscles doing the least work contain least catalase.

2. By increasing or decreasing the external physical work of a muscle the amount of catalase is correspondingly increased or decreased. If the

external physical work of a muscle such as the pectoralis or pigeons is reduced practically to zero, the amount of catalase is reduced by approximately 38 per cent.

3. Catalase is greater in amount in the muscles of warm-blooded animals in which oxidation is more intense than in corresponding muscles of cold-blooded animals in which oxidation is less intense."

Dr. Corlette asks, Could the equine disease be explained in terms of catalase deficiency? and continues:—

"In warm-blooded animals the general metabolic processes of the body are adapted to carry on at or very near to a certain level of temperature which varies somewhat in different species. The organism possesses means of regulating the balance between heat production and heat loss, so that an even temperature may be maintained in its vital parts. The mechanism is partly chemical and partly physical. The chemical regulation is procured by alteration of the rate of combustion of fuel, more being burnt as required when heat loss is great, whereas when the surroundings are warm, combustion is reduced to a minimum. The seat of this process of combustion is in the muscles. They are the chief furnaces of the body, and it is to be remarked that though combustion is active in a muscle doing mechanical work, it is also active whenever required for heat production, whether work is being done by the muscle or not.

"The physical regulation is achieved by increasing or decreasing the quantity of heat lost. The chief channel of heat loss is the skin. When the surroundings are warm and when it is necessary to get rid of a large amount of heat, the skin becomes warm and flushed with blood, and in animals that sweat, sweat secretion is poured out. If while adjusted to such warm surroundings an animal is suddenly exposed to cold and especially to cold wind or to cold rain or fog, there immediately ensues a great flood of heat loss, and this continues until the body becomes re-adjusted. Naturally this tends to produce a fall in the level of temperature. The physical mode of re-adjustment is by altering the condition of the skin which from being warm and flushed and moist becomes cold, pale, shrunken and dry. At the same time the mechanism of chemical regulation is put to work. The rate of combustion is forced up in the muscles and more heat is produced as compensation for the increased loss that has been and is being incurred. This process, therefore, involves a 'rush' call on oxidation, a rush on the stock of fuel, and a rush on the stock of catalase in the muscle.

"In the stable the heart and respiratory muscles are at constant work, but the muscles of the limbs are confined to the work done in supporting the weight of the animal. If Burge's observations have any application, they indicate that the catalase content of the muscles of the limbs will be adjusted to the metabolic requirements of supporting the weight only and not of progression, as in the cognate case of the pectoral muscle of pigeons. The catalase content of the muscles of the hind limbs will not need to be any greater than it is in the fore limbs. It is quite otherwise, however, in progression. In progression the great thrusting muscles of the hind quarters do the hard work, the muscles of the fore quarters not being concerned in the thrusting, but in subsidiary action. When a horse is harnessed to a load and driven, there is at once a call for power and the motor stimulus activates the metabolic apparatus in the thrusting muscles. Oxidation increases, catalase is requisitioned, the present supply is used up and more is demanded. Under normal conditions the demand is supplied. But suppose there is something wrong with the liver function, be it temporary or permanent, so that it is inadequate to supply catalase to the full extent required. In that case, though the motor stimulus to the muscle continues, the catalase content gradually fails. With the disappearance of the catalase the protective physiological inhibition of the local digestive enzymes disappears also.

"There is another accompanying factor. It is known that in the processes by which energy is liberated in the muscles, there is in the intermediate metabolism a formation of lactic acid. Normally this does not accumulate. It has been shown, however, by Fletcher and Hopkins that when there is a deficiency of available oxygen in the muscle, lactic acid accumulates. Presumably, an inadequate supply of catalase at the seat of activity would reduce oxidation and so favour hæmolysis and autolysis. Autolysis requires an acid medium. In the absence of oxidation, therefore, there ensues paralysis of function, accumulation of acid and autolysis. Thus the structure of the muscle is destroyed. If this can occur, the blood passing through the muscle is also exposed to attack, at least to some degree, and its cellular elements will therefore become disorganised. In this way an hæmolysis as well as autolysis of muscle may be presumed to occur at the seat of the lesion, and from that source the product enters the bloodstream and passes to the kidneys, where it is excreted.

"The presence of sugar in the urine could reasonably be accounted for by liberation of glucose by hydrolysis of glycogen in obedience to the motor requirements, but inability to oxidise this sugar in the great muscles to a parallel extent causes an accumulation. The raising of the glucose content of the blood then produces the glycosuria.

"I have said that during rest in the stable the heart and respiratory muscles of the horse are continuously at work, and I contrasted this with the condition of the thrusting muscles. Nevertheless, during exercise the heart and respiratory muscles have to increase their output of work very greatly, though the contrast is not like that of the thrusting muscles which pass from prolonged rest to extreme activity in a few seconds. I am prompted here to turn aside for a moment to refer to the phenomenon of 'second wind' in athletes. During violent exercise there is after a time considerable dyspnœa,

DIVISIONAL REPORT.

Western Counties Division.

Annual Meeting.

Constitution and Work of the N.V.M.A.

The Annual Meeting of the above Division was held at the Royal Clarence Hotel, Exeter, on Thursday, March 27th, the President (Mr. G. W. Lansley, of Axminster) presiding. He was supported by the President of the National Association (Mr. Dawes), and the following members were present: Messrs. R. E. L. Penhale, Torrington; P. W. Bloye, Plymouth; R. Barons Nelder, Exeter; W. G. Blackwell, Exmouth; P. Penhale, Barnstaple; J. Dunstan, Liskeard; R. Ferris, Totnes; W. Roach, Exeter; Charles Masson, Torquay; W. B. Nelder, Exeter; H. E. Jackson, Paignton; J. R. Conchie, Minehead; W. Ascott, Bideford; W. Pentnall, Holsworthy; and G. Roberts, Cullompton. The minutes of the previous meeting were taken as read, on the proposition of Major Ascott, seconded by Mr. Nelder.

The Hon. Secretary reported that at the last meeting he brought forward the matter of the alleged infringement of the Veterinary Surgeons Act by a certain firm. He was instructed to write the R.C.V.S., which he had done, and they replied asking for certain evidence, proving that the firm in question had issued certificates implying that they were veterinary surgeons. He (Mr. Stableforth) had been unable to get any one to come forward to prove the case. He had approached several farmers in the district, but neither of them cared to take the matter up.

The President: It comes to this: that the document you sent is not sufficent evidence. I think what you have stated convinced others.

No further action was decided upon.

The Hon. Secretary reported, in regard to *The Field* Distemper Fund, that the Division had made a grant of two guineas to this fund; and in response to a request made by him, additional copies of the annual report were to be supplied for distribution amongst the members of the Association. The Hon. Secretary's action in the matter was considered satisfactory.

The Hon. Secretary reported that Mr. C. H. Golledge, of Sherborne, had tendered his resignation, on account of his advancing age. Mr. Stableforth added that Mr. Golledge was an old member of the Association. He did not practice now, and of course had not attended the meetings of the Division.

Major W. Ascott suggested that Mr. Golledge be asked to reconsider his resignation. This was agreed to.

The Hon. Secretary stated that he had received an invitation from the Royal Sanitary Congress, which was to be held this year at Liverpool, to appoint delegates to represent the Association at the Congress.

The meeting approved of the suggestion of Major Ascott, that one of the members in London might be asked to attend the Congress. It was thought that Liverpool was too far distant for local members to attend as delegates, the President remarking that the Division's balance was not very great this year.

The Hon. Secretary reported the receipt of the following communication:—

"At a meeting of the Central Branch of the National Veterinary Association, held at 10 Red Lion Square, London, on January 3rd, 1924, the following resolution was passed:—

"That this meeting of the Central Branch of the National Veterinary Association, expresses its utmost confidence in the judgment of the veterinary officials of the Ministry of Agriculture, to deal effectually with the difficult problem with which they are confronted in connection with the present extensive outbreak of foot-and-mouth disease."

Mr. Dawes remarked that he attended the meeting of the Council of the National Association, at which Sir Stewart Stockman, Chief Veterinary Officer of the Ministry, came before them and made a statement. That statement appeared in the *Veterinary Record*. Everyone at the meeting who heard Sir Stewart's statement readily agreed to support the Ministry in the work they were doing. The resolution had been before several associations, and had been unanimously adopted. He (Mr. Dawes) thought that in these days, when some opinion was against the Ministry, Sir Stewart Stockman should be backed up by members of his own profession.

On the motion of Mr. J. Dunstan, seconded by Mr. Penhale, the meeting agreed to support the resolution.

Mr. Dunstan expressed the view that they had every confidence in Sir Stewart Stockman and in the way in which he was dealing with foot-and-mouth disease.

(*Continued from previous page.*)

but if the exercise be continued, the discomfort disappears sometimes quite suddenly. Pembrey has stated that the physiological explanation is unknown. I would offer the suggestion that 'second wind' might be plausibly explained by imagining that it is brought about by the establishment of catalase equilibrium in the heart and respiratory muscles, catalase production having caught up to the demand.

"Possibly one could explain the pain and stiffness caused by over-use of an untrained muscle by imagining a minor degree of what we have supposed to happen in the thrusting muscles of a horse whose catalase production is deficient.

"It may be said that I have no right to suppose a derangement of liver function merely at random and no better ground than that it provides a way out of a difficulty. But it is not a random throw. There is more ground for suspicion than many might expect. There is nothing clear, nothing definite, but there is something to think about.

(*To be continued.*)

It was further decided that copies of the Associations decision to support the resolution should be forwarded to the Ministry of Agriculture and to Sir Stewart Stockman, also that it should be reported in the local press.

Mr. C. CROWHURST (Bodmin) wrote stating that he did not think veterinary surgeons should act as honorary veterinary surgeons at local dog shows. They should be paid an adequate fee for officiating. He had acted as hon. veterinary surgeon at many shows, and last year he acted in this capacity at Bodmin and other places. It took up a lot of time. Veterinary surgeons should be able to charge fees, as many of the exhibits were very valuable and the owners could very well afford to pay.

On the motion of Major ASCOTT, seconded by Mr. JACKSON, the Association decided that the question should be placed on the agenda for the next meeting.

The Association was asked in a letter, read by the Hon. Secretary, to support the candidature for election to the Council of the Royal College of Veterinary Surgeons, of Mr. W. D. Rees, F.R.C.V.S., of Trealaw, Glamorgan, president of the Mid-Western and South Wales Association. He (Mr. Rees) thought that direct representation on the Council was desirable in the best interests of the profession generally. At the present time, as they were aware, there was no representative of the West of England and South Wales on the Council as a practitioner, it would be his (Mr. Rees') aim regularly to attend the meetings to state the general views of practitioners, and to at all times further their interests.

The HON. SECRETARY pointed out that he had known Mr. Rees for a considerable time, they were students at college together. He met him on the occasion of the visit of the National Association and at various committee meetings. He (the speaker) thought that Mr. Rees was a very suitable man for the Council. He was in earnest and would do the right thing for general practitioners. He (Mr. Stableforth) moved that they support Mr. Rees' candidature.

Mr. DAWES said he knew Mr. Rees very well and had great pleasure in supporting the motion. Mr. Rees was an excellent man, and one whom they could well support. He was of opinion that more practitioners were needed on the Council. The rank and file of the profession could not do better than support Mr. Rees.

The PRESIDENT supported the motion, which was unanimously carried.

The HON. SECRETARY read a number of letters from members, apologising for absence. The meeting agreed that a message of sympathy should be forwarded to Mr. Gibbings, who was under treatment at Bath.

Mr. R. B. NELDER (hon. treasurer) submitted the statement of accounts. He noted that the expenditure was a good deal heavier last year than it was in the previous twelve months. The subscriptions to various societies were also rather heavy, although they were not as heavy as in the year 1921-22, when they totalled £32 17s. 2d. As regards the cost of the upkeep of the instruments—three guineas—he hoped to get a reduction this year. The instruments were in good condition and seemed to be appreciated by members of the Association. Some members, however, kept them too long, the average time being one month, whereas it should be only three clear days, after which a charge of 2/6 per day was supposed to be levied. He considered that notice should be given that after a certain date fines would be imposed upon members who kept the instruments longer than three clear days.

Mr. DAWES: We have just the same difficulty in the Midlands.

On the motion of Major ASCOTT, the meeting decided that a notice should be fixed to the box containing the instruments, stating that fines would be enforced.

The HON. TREASURER further intimated that, with regard to the receipts during the past year, if it were not for the balance of £13 brought forward, the Association would be in debt. The total membership was 45, an increase of one. He thought they were justified in maintaining their low subscription of 10/6. The accounts had been duly audited.

On the motion of Mr. PERCY PENHALE, seconded by Mr. R. PENHALE, the accounts were adopted.

The PRESIDENT extended a cordial welcome to Mr. Roberts, whom they were pleased to see was well again.

Mr. J. DUNSTAN proposed, Mr. P. PENHALE seconded and Major ASCOTT supported, and it was unanimously agreed, that Mr. W. L. Richardson, of Wadebridge, should be asked to fill the office of President of the Association for the ensuing year.

The following were appointed vice-presidents:—Messrs. R. H. Penhale (Holsworthy), G. D. Lansley (Axminster), C. Masson (Torquay) and G. A. Roberts (Cullompton), while the following were elected as the Council:—Messrs. Bloye, Masson and H. K. Roberts. with the President, Treasurer and Hon. Secretary.

Mr. R. B. Nelder was reappointed hon. treasurer.

Mr. LANSLEY moved the re-election of Mr. Stableforth as hon. secretary. Mr. PENHALE seconded the motion, which was carried with enthusiasm.

In acknowledgement, Mr. STABLEFORTH said the duties entailed a good deal of work. He had experienced disappointments, but after all he found pleasure in doing the work

It was also agreed that the President and one Vice-President should audit the accounts next year.

Regarding the place at which the annual meeting should be held next year, the Association referred the question to the Council with the recommendation that the meeting take place in Cornwall, if possible.

Mr. H. J. DAWES, of West Bromwich, the President of the N.V.M.A., then delivered the following address:

THE NATIONAL VETERINARY MEDICAL ASSOCIATION OF GREAT BRITAIN AND IRELAND.

Mr. President and Gentlemen:

When your secretary wrote asking me if I would attend your annual meeting and deliver a short address on the National Association, I felt, as President

of the Association, that I must comply with his request. It is rather interesting to come to the Western Counties Division, to give an address on this subject, because I find that a Mr. Warne Raddall, of Plymouth, addressed a letter, dated January 12th, 1855, to the *Veterinarian*, urging the desirability of every county inaugurating an Association of Veterinary Surgeons. Several Associations were formed after this letter, but nothing came of it as regards the Western Counties until 1865, when the West of England Veterinary Association was formed. This was the ninth Association to be formed, and the following year the Association to which I belong, viz., The Midland Counties Veterinary Medical Association, was formed.

Coming to the National Veterinary Medical Association of Great Britain and Ireland, I find this was formed in October 1882, the first meeting being held on Tuesday, May 8th, 1883. The Association was incorporated on April 8th, 1921, and it is the period since its incorporation to which I want to confine my remarks.

Some of the objects of the Association are as follows :—

1.—The promotion and advancement of the Veterinary and Allied Sciences, the affiliation of local societies (whilst preserving their local independence) and the maintenance of the honour and interests of the Veterinary Profession.

2.—To take over or otherwise aquire the goodwill and copyright of the professional magazine or journal known as the *Veterinary Record*.

3.—To collect and disseminate news and information and employ editors, correspondents, authors, writers and others, and to pay for news and information however obtained.

4.—To hold meetings of members of the Association or of the branches, from time to time, in various parts of the country for the discussion of veterinary topics and kindred subjects, and to publish the proceedings of the said meetings.

5.—To grant sums of money out of the funds, or otherwise assist divisions or branches in the provision of scientific demonstrations and lectures for investigating animal diseases or in any other manner promoting veterinary science.

6.—To form, if deemed desirable, ethical committees by the branches, for the consideration and settlement of professional differences.

7.—To support the claims of members of the profession to legitimate veterinary appointments.

8.—To affiliate, combine, or co-operate with any other Association, Society or Corporation having objects similar in general respects to those of the Association, or being capable of being conducted so as to directly or indirectly benefit this Association.

The income and property of the Association shall be applied solely towards the promotion of the objects of the Association.

The Association is practically a federation of local Veterinary Societies called Divisions. Each Division has its own area, local administration and rules. The Divisions are linked together (or should be) in the Association by the fact that every member of a Division should be a member of the Association, and conversely every member of the Association is a member of the Division in the area in which he resides. The Divisions are grouped together for certain administrative purposes into Branches. A Branch shall be such Division or such groups of Divisions as the Association shall require. The Branches shall be four in number : two in England and Wales, one in Scotland and one in Ireland.

At present any Veterinary Association of Great Britain and Ireland shall be constituted a Division. It is hoped later on to extend this to include overseas veterinary societies. This, the Western Counties Veterinary Association, is a Division. The Divisions should be the backbone of the Association ; on their activities depend to a large extent the success of the work of the Association and its reputation as a live body. The work of the Division has a two-fold aspect, looking on the one hand to the direct benefits of its own members, and on the other to the part to be taken by the Division in the work of the Association as a whole. As the individual members are united together for their common benefit for the advancement among them of veterinary science, and for the maintenance of the honour and the interests of the profession locally, so the Divisions, in turn, are united in the Association to co-operate for the general good of the profession, and of the Association and for aiding the progress of veterinary science.

Gentlemen, I cannot understand any veterinary surgeon not belonging to the Association in his own area. It is impossible to attend the meetings without learning something, especially as the members are always ready to impart any knowledge they possess for the benefit of the members. Personally, I know that my joining the Midland Counties Veterinary Medical Association has proved one of the best things I have ever done. In no other way could I have obtained quite the same practical information, and in no other way could I have received so naturally the needed fellowship, or so freely the right hand of friendship wherever I went. This experience convinces me that those veterinary surgeons who have not yet joined an Association should lose no time in doing so, if they realised all that membership gives them. My experience extends over a very long period, as I have been Hon. Secretary of my Association for thirty-three years, and for two years its President, and it is my proud boast that during these years I have only once missed one meeting and that through illness. It has often been difficult for me to attend, as I have always been a busy man, but I would not let anything stop me from attending these meetings. If there are any members of the Profession in your districts who are not members of the Western Counties, try and do all you can to persuade them to join.

All the veterinary surgeons in the area of any Division should not only be members of the Division, but should also be subscribing members of the National. It can only be indifference or want of knowledge on the part of those who do not join, because

they receive good value for their money, viz: full reports of all proceedings of the National, also the *Veterinary Record*, the official journal of the National, every week, which cannot be obtained in any other way except of the payment of 1/- per copy; copies of all papers read at the Annual Congress; also a number of other benefits, all of which you get for two guineas per year. This is not much when you compare the benefits which we could get as a profession if we were united. Before leaving the question of the Division, might I suggest regular attendance at the meetings of your Division. Have you ever thought what it means to a man to go to an immense amount of trouble and time to prepare a paper for discussion and to find a very meagre attendance? I have known men to come two hundred miles or more to read a paper; these are men full of enthusiasm for the profession and they do not mind any amount of time and trouble to enable them to give of their best to the profession.

The Council of the Association is the body that manages the affairs and business of the Association. It is composed of the officials of the National, representatives from each Division of the Association, viz., the secretary and one for each twenty-five members or portion thereof; two representatives from each branch of the Association. No person shall be eligible for election as a member of the Council unless at the time of his election he shall be a member of the National Association.

You will quite see that the Council as constituted is truly representative of the profession, and Divisions should be particular to see that they elect representatives to serve on the Council who will attend its meetings; as the Division would then be kept in touch with the affairs of the Council. The Council meetings are usually well attended, but nothing like they ought to be to make them representative. A number of committees are formed from the Council and the members who are appointed to them do an immense amount of work which does not appear in print.

The principal Committees are as follows:—

1. Finance and Advisory Committee—This Committee meets monthly and controls the finances of the Association. It also advises on all matters that need immediate attention and also acts as an Executive Committee.

2. Editorial Committee—This Committee meets weekly and deals with all publications of the Association, particularly the *Veterinary Record*. It reads through all material submitted and controls advertisements.

3. Appointments Committee—This Committee meets about every six weeks and deals with appointments at home and abroad. It is particularly concerned with State appointments at home and conditions of service in the dominions and colonies. Every member is personally acquainted with some special district or county.

4. Public Health and Veterinary Inspectors Committee—This Committee now carries on the work formerly carried out by the National Association of Veterinary Inspectors, which is now merged in the National Veterinary Medical Association.

5. Special Fees Committee—Formed to do special work under the Milk and Daires (Amendment) Act, 1922. It also watches the interests of the profession and, if possible, tries to arrange suitable fees to be charged.

6. Biological Products Committee—This Committee is for the purpose of enquiring into the distribution and standardisation of biological products and the misuse of tuberculin, also parliamentary bills on these subjects. It has made one report, but is still at work. It has collected a vast amount of evidence from a number of witnesses who have personally attended before the Committee.

7. Articles of Association Committee—This Committee meets for the purpose of revising the Articles of Association.

You will quite understand that these Committees entail an enormous amount of work which, directly or indirectly, benefits the profession, and also means a large amount of office work.

The Annual Meeting and Congress is to be held this year in the beautiful city of Aberdeen, and commences on September 8th. I attended a few weeks ago the first meeting of the Provisional Committee (which is the Committee that does all the work in connection with the Annual Meeting and Congress). The meeting, for convenience, was held at Perth. I never saw a more enthusiastic lot of members, they are out to make the Congress a great success, and I have but little doubt that it will be one of the best Congresses that has ever been held. Gentlemen, I ask as many of you as possibly can to come to the Congress. I am sure you would never regret it and you could probably arrange it to fit in with your annual holiday. A number of most important papers have already been promised and the social side is to be well looked after. A Ladies Committee is being formed for entertaining the ladies. We want to show our friends across the border that we appreciate their efforts in connection with this Congress, by turning up in large numbers.

From what I have said in this address, you will have gathered something of the machinery of the National. It is up to us to make this Association worthy and representative of the profession. In fact, what the British Medical Association has done for the Medical Profession, we want the National Veterinary Association to do for the Veterinary Profession. Our profession is only a small one and it ought not to be dificult to get it united. The success of the National is assured, and its success is far beyond what the pioneers could have imagined. At the present time we have 1,400 members, and cash in hand and invested, over £2,000. The circulation of the official organ, viz., *The Veterinary Record*, is about 1,800. Speaking of the *Veterinary Record*, you will all have seen how much it has improved and increased in size. It will go on increasing as the material increases. It is often stated in the *Record* that there is a great shortage of clinical articles. If every mem- of the National contributed one clinical article per

year, we should have no further remarks made with reference to any shortage. If any member has not the time to prepare an article, let him send the rough notes to the general secretary and he will do the rest.

I have refrained from mentioning any names in connection with the great progress that has been made by the Association. Time would not permit of my doing so, but the names of the pioneers of the National are well known to the members of the profession; and their names will go down to posterity. The "National" is out to benefit the profession, and will do it. It is too soon yet to see many results from the work of the "National," but this will come in time and I am sure that the Association will become in time a powerful body working on behalf of the Veterinary Profession.

I would like to mention the name of our General Secretary Mr. Livesey, who is carrying on the good work started by Professor Basil Buxton, the late Secretary. I am sure in Mr Livesey we have a very live man cut out for his job, and the Association is very fortunate in having such an enthusiastic and thorough man for its General Secretary. The Assistant Secretary is also a veterinary surgeon, and in addition, is a first class reporter, able to take full particulars of the proceedings and by arrangement also reports the meetings of several of the Divisions. The Association has well equipped offices at 10 Grays Inn Square, London, W.C. 1, and Mr. Livesey will always be delighted to see any of the members there.

Gentlemen, in conclusion, let me say how very pleased I have been to attend your Annual Meeting, and to say a few words about the work of the National. I trust this Division will become a powerful unit in the work of making the National Veterinary Association of Great Britain and Ireland truly representative of the profession.

Fees.

The meeting next proceeded to deal with certain questions contained in a letter, copies of which had been circulated amongst members of the Division. The letter stated that an endeavour was being made by the Association to arrange uniform fees chargeable by members under the Milk and Dairies Order, 1922, and for tuberculin testing in general. Members were asked to state their views on the following points: (1) fees to be charged for the quarterly clinical examination of dairy herds; (2) fees ditto for the bi-annual application of both the tuberculin tests (subcutaneous and opthalmic) and clinical examinations (these three tests are to be made at the same time); (3) application of the subcutaneous tuberculin tests to herds in general.

The President (Mr. Lansley) said the idea of circulating the letter was to obtain opinions of members as to what fees should be charged under the Order. Some fees varied considerably in different districts.

Mr J. Dunstan said the Medical Officer in his district (Liskeard) had asked him to accompany him on visits of inspection to dairy cows, and he replied that he would do so on certain conditions. As regards the first question in the letter, he (the speaker) had never been asked to do such a thing. Then, with reference to the second question, there was no demand for such tests in Cornwall, while as regards question three, he thought a fee for the tests should be according to the ability to pay of the owner of cows inspected. He made a charge of £2 2s. per cow, with 1/- per mile travelling allowance one way.

The President: It would seem that you have fixed £2 2s. for the first animal.

Mr. Dunstan went on to quote from the reports of the National Association of Veterinary Inspectors, and the National Veterinary Medical Association. The former stated that the charge for tests up to four animals on the premises was £2 2s., beyond four animals 5/-, and 1/- per mile one way travelling allowance. The latter report stated that the charge was £3 3s. per animal up to the number of eight, and 5/- each beyond that number.

Major Ascott said at their last meeting he took notes of what the Secretary read out as to the fees decided upon by the Committee. He wanted to know whether, in addition to bi-annual tuberculin tests, quarterly inspections would be enforced.

The Hon. Secretary replied that the enforcement of both tests depended upon the quality of the milk.

Major Ascott: It will affect the cost to owners considerably if you have quarterly inspections and bi-annual tuberculin tests, and I do not think owners will be found to take it on. In 1920 we held a meeting in response to a circular relating to fees, and it was then agreed that the fee for the first animal should be £1 1s., 10/6 each up to the fourth and 5/- each after that number and mileage allowance for two visits only.

The President (Mr. Lansley): In 1920 the fee was £1 11s. 6d. for the first animal, 10/6 each for the second, third and fourth, and 5/- each for any other.

Major Ascott questioned whether owners of cows would be able to pay for the tests without State help. He had taken a little trouble to put some figures together, with a view to seeing what owners of dairy herds would be called upon to pay for the various tests.

Would owners pay a guinea four times a year for clinical examination of one animal? He did not think they would unless the State assisted them. Then as regards the subcutaneous tests, he estimated that the cost per cow, including the mileage allowance, would be £3 10s. For twice a year the cost would be £7. For clinical examination there would be a further £2 10s., making a total of £9 10s. for testing one animal. If they multiplied their figures, owners would kick against a fee like that. Supposing they took an average herd of ten cows. The figures for five cows would be £13 15s. a year, for ten £18 5s., for twenty £26 15s., and for thirty £31 15s. a year.

He would grant that these tests were made largely for the benefit of the public, but he did not think that the owners of herds would come into the limelight very much unless they got some assistance from the State. Proceeding, the speaker mentioned the need of milk being produced under more cleanly conditions than was the case at present, for milk was

an important article of food. The present unsatisfactory condition was partly the fault of local authorities. They had not insisted upon bye-laws being carried out, causing cow-sheds to be properly kept and cleansed. Local authorities had these powers, and the public had read a great deal in the papers lately. Torrington had come into the limelight recently because they refused to adopt the Milk and Dairies Order. Bideford had laid low in the matter. The Rural District Council had refused to adopt the Order, but he did not know that their action had been reported in the newspapers. He did not think there were half a dozen local authorities who had adopted the Order. As veterinary surgeons they ocould do a great deal more than they had done in the past to improve the conditions under which milk was produced. They ought to get some kind of force to bear on local authorities under which they would be compelled to employ a veterinary surgeon who should be the recognised person to carry out the inspections and tests, to see that the conditions were satisfactory and the cows healthy. How this could be done he was rather doubtful. Mr Gibbings had asked him to say that he had thought a great deal about the matter and that he would fall into line with whatever the Division decided to do.

The HON. SECRETARY mentioned that, as regards the taking of temperatures of cattle, the matter was discussed by a committee in London and the secretary was directed to write the Ministry of Health, and they were quite emphatic about the temperatures being taken at the times stated. At length the Council referred the figures back to the committee, who afterwards did not reach an agreement.

The President of the National Association (Mr. DAWES) said he was a member of the committee who met in London and he took the same view (and had done all along) as was taken by Major Ascott. Members of the committee analysed the fees, but did not go into the question of multiplication as Major Ascott had done.

Although he thought the fees were fair, he did not think farmers could pay them. He must say that he had given a deal of thought to the questions of fixing fees for this work, and found it a hard matter to decide. When the figures were placed before the Council, the latter found that they were too much and sent them back for revision and the matter stood in abeyance at the present moment. Major Ascott had referred to bye-laws to aid the production of clean milk—recently he paid a visit to a place engaged in sterilising milk. He inspected a machine which removed all objectionable matter from milk, and was surprised at the collection of dirty material that remained in it when the machine had finished working in the evening. He trusted that they would be able to obtain a satisfactory decision regarding the fees to be charged for testing, etc., through a lead given by the National Association.

Mr DUNSTAN remarked, with regard to the frequent taking of temperatures of cows, that it was impossible for a single man in practice to do the work, especially where he had long journeys to cover.

Mr. MASSON hoped that a decision would be arrived at that day regarding a uniform scale of fees. He mentioned that he examined twenty-three cows under an hour and considered that £3 3s. was not bad pay for an hour's work. After criticising the application of the tuberculin tests, Mr. Masson urged that veterinary surgeons should boom Grade A Milk for all they were worth.

Mr. LANSLEY : In 1920 this Association agreed upon a scale of fees including 2s. 6d. per head and 9d. per mile travelling allowance. There was at one time some talk about 6d. per mile, but it was never put into force.

Mr. R. B. NELDER : That was suggested.

Mr. DUNSTAN moved that, for quarterly clinical examinations of dairy herds, the fee should be 2s. 6d. per head, plus 6d. per mile for visiting.

Eventually it was agreed that the fee should be 2s. 6d. per head and the mileage allowance 9d per mile each way.

Regarding the application of the subcutaneous tuberculin test, the PRESIDENT said the decision arrived at in 1920 was still upheld. They then fixed the fee at £1 11s. 6d. for a single animal, 10/6 for the second, third and fourth, and 5/- per head afterward, also that the mileage allowance for two visits be 9d. per mile each way. Members of the Association would not object to a member charging more than this. What they wanted to do was to fix the minimum fee.

After further discussion, Major ASCOTT moved that the fees be £1 1s. for one animal, £1 11s. 6d. for two, and 5s. per head for other animals up to twenty on the same premises, and that the mileage allowance be 6d. per mile for each journey.

Mr. PENHALE seconded, remarking that it was the most practical proposition he had heard that day.

Mr. CASSON, however, regarded the fees as impracticable.

Mr. R. B. NELDER proposed as an amendment that the question of fees in connection with tuberculin tests be adjourned until the next Annual Meeting.

The HON. SECRETARY held that they should reach some decision as to the fees to be charged. He supported Major Ascott's motion, although the scale was lower than he wished to see it.

Mr. R. PENHALE seconded the amendment.

On a division the amendment was lost by seven votes to six, and Major Ascott's proposition was agreed to.

The PRESIDENT (Mr. Lansley), in proposing a vote of thanks to the President of the National Association for attending and giving them such an interesting and informative address on the work of the National Association, expressed the hope that he would pay the Western Counties Association another visit in the future.

Major ASCOTT, in seconding, said he was at college at the same time as Mr. Dawes and they in the West

Country were very proud of him and the position to which he had attained in the profession.

Mr. PENHALE, as the oldest member of the Association, supported the proposition, which was heartily carried.

Replying, Mr. DAWES said he was quite certain that the National Asociation was going to be a great power for the benefit of the veterinary profession. When it was well established he hoped the profession would be more united. There must be uniformity in the matter of fees.

The HON. SECRETARY voiced the thanks of the meeting to the retiring President (Mr. Lansley), and added that the Association had had in Mr. Lansley an excellent chairman.

Mr. R. E. L. PENHALE seconded, and congratulated Mr. Lansley upon the able manner in which he had conducted the meetings of the Association.

Mr. P. PENHALE supported the Hon. Secretary's proposition, which was enthusiastically carried.

Mr. LANSLEY suitably replied, and the proceedings terminated.

W. P. STABLEFORTH, *Hon. Secretary.*

Dire Sequel to a "Stray Thought."

A contributor has been moved to perpetrate the following, which we reproduce for the amusement, if not the edification, of our readers :—

Sir,—Noticing that Mr. Alexander wants a romance about a V. S., I herewith supply same. You want the best romances. We have them ! Read on from here.

THE ASSISTANT'S ADVANCE,
OR THE VIRTUOUS VETERINARY.

The village church clock was just striking 11-30 p.m. when young Ernest Stavesacre folded up his last packet of condition powders and reached for his hat. "Thank heavens, I've finished, and have the rest of the evening to myself," he murmured. Just at that minute his employer's daughter, Miss Aspirin Ergot, ran up to the surgery. "Hello, Ernest, are you off so soon ?" she enquired. "I believe Daddy wants to ask you why you didn't slip another visit into old Mr. Mumble, of Little Puddleton; his bill is only £15 6s. 9d. for this week." "Oh, drat old Mumble," cried Ernest peevishly; "but Aspy," he added, "what are you doing in the yard at this time of night ?" "Well, Ernest," she replied, "I partly came to see you." As a matter of fact, she had a sneaking regard for Ernest, for often after her father, old Jasper Ergot, had been beating Ernest about the head with the parturition hooks for some trifling misdemeanour, she would come out and condole with him. "Ernest," said Aspirin, carelessly toying with a silver mounted écraseur, "when are you going to start a practice on your own ?" "Why, Aspy," replied that youth, looking as soft as a pot of electuary in August, "you know I've got no money."

"My boy," said Aspirin, "listen to me. You know father's old racing mare, Distomui Hepaticum, the one with follicular mange ?" "Yes," gulped Ernest, his eyes rolling like a centrifuge, "Well," fcontinued Aspirin, "she is entered for Little Puddleton flapping races next Friday as ever is, and what's more, she will win, she can't help it, it's all arranged and it's her turn anyhow," and playfully belting Ernest on the back of the neck with a Burdizzi emasculator, she popped indoors.

As Ernest was polishing the brass plate next morning he felt as deeply moved as if he had taken two grains of arecoline. "Fancy giving me the tip," he mused; "well, I'll do it, I'll plunge, I'll put my calving apron on it !"

All that day (Thursday) Ernest walked about like one afflicted with stomach staggers. Success or ruin ! success or ruin ! he thought. Several times he walked into the loose box and gave the old mare a few rib binders with the cattle probang just to keep her heart up.

To-morrow—ah !—Would she win ? Ah ! again.

* * * *

The fatal day arrived. Ernest helped to prepare old Hepaticum, and with a final rectal injection of tinct. zingib. et nux vomica, she looked as fit as a drug traveller. Her jockey was as cunning as a canine specialist, and even had 2/6 on each way himself, so the prospects seemed as rosy as a pound of bole armen. Ernest would not be able to see the race himself, so he set out on the round with a heavy heart. In fact, he had to use two hands to throw a bullock, which shows his mind was not on his work. At last three o'clock came. Ernest was back in the yard waiting at quarter past three; there was a great clatter, and Ebenezer, the stableman, galloped into the yard, vigorously beating the foundered pony with a milk-fever syringe. "Oh, Marse Ernest," he mumbled—(You see he was 97 years old and had Bright's disease.) "Speak, dolt," yelled Ernest, jobbing him with the blackleg needle; "Has she won ?" "Aye, that her have," wheezed old Ebenezer; "At 100 to 8 and all," and so saying, he sank quietly down on a half-hundredweight of mag. sulph. and died. At long last Ernest's dream had come true; but was he excited ? Oh, no not he. Before telling Aspirin of his good luck, he carefully pulled the body of old Ebenezer round to the back of the shed and left it among the empty horse-mixture tins. Then everything being tidy he strolled indoors. "Aspirin," he called, "it's come off." "What !" said Aspirin; "that splint you put on the bull-pup ?" "No, no," said Ernest; "your tip, and I've won just £950." "Oh, splendid," cried Aspy. "Now, of course, you will be able to buy a practice, and perhaps get married," she added coyly. Not on your life, kid," smiled Ernest; "I'm going to buy a jolly good tobacconist's shop, and put the smartest girl in town as manageress and ——— but hello, what's up ?" he broke off as Aspirin rushed away sobbing, and in a few minutes a loud report resounded through the house. "Hum,' soliloquised Ernest; "I've told the old man not to leave the Greener humane killer indoors; well, anyhow, she had adenoids." So saying, he walked slowly down to the White Hart to draw his winnings.

HARKAWAY.

Mr. William John Mulvey, J.P., veterinary surgeon, of Nicholas Road, Upper Tooting, S.W., and of Chelsea, who died on May 4th, aged 80, has left property of the value of £7,198, with net personalty £4,378. The testator gives £750, part of the funds of his life insurance, to his son, Harold, he entering into a covenant that he will not, for a period of ten years, reside within thirty miles of Charing Cross.

Mr. W. S. King, of 264 Burdett Road, on the dissolution of his partnership with Mr. J. W. Rainey, has now become sole veterinary surgeon to the Stepney Council, in succession to Mr. W. H. Caton, who has retired for reasons of health.

PERSONAL.

Death.—On July 11th, at 145 Church Lane, Old Charlton, London, Jane, widow of the late John Carter, aged 84.

NOTES AND NEWS.

The Editor will be glad to receive items of professional interest in these columns

Diary of Events.

July 24—Meeting of the Western Counties Division at Wadebridge.

Aug. 1—Meeting of the North Wales Division at Denbigh.

Sept. 8-15—N.V.M.A. Annual Congress at Aberdeen.

RAIL VOUCHERS, ENTITLING MEMBERS TO TRAVEL TO THE ABERDEEN CONGRESS AT THE REDUCED RATE OF A FARE AND A THIRD FOR THE DOUBLE JOURNEY, ARE NOW AVAILABLE. MEMBERS MAY OBTAIN AS MANY VOUCHERS FOR THEMSELVES AND THEIR FRIENDS AS THEY DESIRE, AND APPLICATION SHOULD BE MADE TO THE GENERAL SECRETARY, 10 GRAY'S INN SQUARE, W.C.1, AT AN EARLY DATE TO AVOID DISAPPOINTMENT.

A very excellent gathering of veterinary surgeons took place at the joint meeting of the Royal Counties and Central Divisions at Reading on July 11th. About seventy members were present at the National Institute for Research in Dairying, where Dr. Stenhouse Williams gave an address on the work of the Institute, and afterwards conducted the members over the premises and the laboratories. A full account will be published in the *Record* at a later date. At present we can only comment on the exceedingly pleasant nature of the meeting. It was like a re-union of old school fellows.

* * * *

The sun was very hot indeed, and it was a delightful change for the town members in such weather to find themselves in such pleasant surroundings. We doubt if the "Central" has ever had a pleasanter outing for the last meeting in its official year, and we doubt if the President of the "Royal Counties" ever presided over such a large attendance. It must have been a happy day for Mr. J. W. McIntosh and Major Rees-Mogg to see such a highly successful conclusion to their years of office, and they are to be congratulated. At the same time, a word of praise must be recorded for the Hon. Secretaries, for the arrangements were as near perfection as possible. Most of the detail had been arranged by Mr. Little, and the thanks of everyone are due to him for his trouble.

* * * *

A very welcome visitor was Mr. W. W. Lang, the Secretary of the Lincolnshire Division, who has now entirely recovered from his accident. We were very glad to hear that Mrs. Lang also has made a complete recovery. It is especially gratifying and at the same time useful for Secretaries of Divisions to visit other meetings than their own. They always receive an especially warm welcome, and they can take back with them some fresh ideas and inspirations for the successful management of their own Division.

It was very encouraging to hear how many members expressed the intention of going to the Aberdeen Congress. They must not forget to apply for rail vouchers at 10 Gray's Inn Square, and at the same time notify the local secretary at Aberdeen, so that tickets may be reserved them for the civic luncheon and other entertainments.

A list of recommended hotels at Aberdeen will be circulated amongst members in the course of the next week, but meanwhile we may draw attention to the fact that the headquarters of the Association during the Congress will be at the Palace Hotel. For those who prefer to take rooms in private houses and boarding establishments, the local secretary, Mr. McAllan, has prepared a list of places which he can recommend, and will be glad to give all information to intending visitors, if application is made to him in good time.

CORRESPONDENCE.

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

All correspondence must bear the name and address of the contributor for publication.

The Editor does not hold himself responsible for the opinions of his correspondents.

The National Veterinary Medical Association.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—I can assure Mr. Dunkin that I do not withdraw anything from my letter of 10th May. The incidents referred to are of sufficiently recent occurrence to prevent anyone forgetting the facts. I am not in the habit of putting anything in print unless it is carefully thought out, and nothing in my letter is liable to misconstruction by anyone who does not choose to misconstrue it.

Mr. Dunkin apparently had difficulty, when he was in practice, in knowing which of his clients misused tuberculin, so that any evidence he might give on that subject may be discounted, and he cannot honourably join with those who charge the agricultural community with a widespread system of fraud. His acquaintance with his clients' doings would not appear to have been very intimate. We all know there is misuse of tuberculin, and some form of control of tuberculin might have been nearer of attainment but for setbacks from mismanagement by the N.V.M.A. I may be wrong, but I rather think Mr. Dunkin himself played some part in the matter. I do not recognise any claim Mr. Dunkin may make to superior knowledge of "the difficulties and requirements of the practitioner."—I am, etc., S. H. GAIGER.

83 Buccleuch Street, Glasgow.

15*th July*, 1924.

Veterinary Inspectors and Foot-and-Mouth Disease.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—I am directed to state that, for some time past, the Ministry has arranged that facilities may be given to veterinary inspectors of local authorities to visit premises upon which outbreaks of foot-and-mouth disease have occurred, provided that the inspectors are prepared to take all necessary precautions.

Any veterinary inspector of a local authority to whom such facilities are afforded will be required to provide himself with rubber boots and overalls capable of thorough disinfection. The veterinary inspector should arrange to visit the scene of the outbreak as soon as he is notified by his local authority of its occurrence, as operations in connection with the outbreak cannot of course be delayed. The Ministry thinks that you may possibly desire to bring this fact to the notice of veterinary inspectors, who might otherwise not be made acquainted with the fact.—I am, Sir, your obedient servant, S. A. PIGGOTT.

Ministry of Agriculture and Fisheries,
4 Whitehall Place, London, S.W.1.
14*th July*, 1924.

The Formation of a Tubercle-free Dairy Herd.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—With reference to the paper, "Experiences in the formation of a Tubercle-free Dairy Herd and the Production of Certified Milk," presented at a meeting of the Scottish Branch of the N.V.M.A., by E. P. Calder, M.B., Midlothian, I should not like it to go forth that the Veterinary Profession has been lacking in research from this point of view. To my knowledge such a tubercle-free herd has been established by a veterinary surgeon from purchasing heifers in the open market at times prices. The herd in question was tested by three different veterinary surgeons by the subcutaneous, ophthalmic and intradermal methods on different occasions and tubercle-free milk produced in under one year from purchase.

Owing to circumstances into which it is not necessary to enter here, the herd was disposed of, on the completion of the lactation periods, at a small profit.—Yours, etc., W. S. STEVENS.

Southill, Wincanton,
12*th July*, 1924.

The "Dick" O.T.C. Sports Meeting.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—I wish to draw attention to the notice in the present issue regarding the Sports Meeting when in camp.

Sports day has been such a success as a social gathering during the last three years, that I wish it to be more widely known among past members of the contingent, particularly pre-war members, so that if they are able to reach Edinburgh they will make an effort to come and renew old friendships and memories on July 26th.

We also extend our invitation to all members of the profession and their ladies to come and spend an afternoon and evening in camp with us.

As this is the first time such a general invitation has been made, it will assist in making the necessary catering arrangements if those intending to be present will send me an early reply.

The contingent being mounted while in camp, most of the events will be mounted ones.—W. M. MITCHELL, Captain, M.C.

Royal (Dick) Veterinary College, Edinburgh.
10*th July*, 1924.

The Veterinarian in Fiction.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—Some twenty-five years ago, a comedy was produced on a London stage entitled "The Lyre and the Lancet," in which the chief characters were a rising young poet and a veterinary surgeon bearing the same name. The former had been invited to an "At Home" by "the daughter of the house," and the veterinary surgeon had been summoned to attend a patient. The veterinary surgeon was, in error, shown into the drawing room—the daughter had left the room temporarily—and he was received as the popular idol. The result was extremely amusing, but the general "get-up" and deportment of our brother was anything but flattering to the profession.

Someone wrote an indignant protest to the *Record*, and the inimitable Wm. Hunting soothed his ire by reminding him that no one was subjected to more ridicule on the stage than the curate, yet no profession was more respectable than the Church.

"Mary Beaudesart, V.S.," a recent novel by Kathrine Tynan, is quite interesting. The heroine's ambition is to graduate as a veterinarian. Her guardians pour ridicule on the idea, and are anything but complimentary to the profession. Mary defends it with great skill.

The average author of a book or of a play, in choosing a character, aims at something distinctive or picturesque. The modern practitioner is common-place, and does not differ in appearance and dress from his fellow-citizens. His prototype—the hoss doctor—was at least picturesque, and appeals to the author as a type.—Yours truly, L. W. WYNN LLOYD.

Carnarvon,
8*th July*, 1924.

Radiographical Information Required.

TO THE EDITOR OF THE VETERINARY RECORD.

Sir,—Can you inform me where I can get radiograms taken of small veterinary cases, *e.g.*, dog and cat? On quite half a dozen occasions of late it would have been of great service to me to have known of such a place.

In the sister profession one frequently finds that one practitioner in a district finds it pays him to specialise in radiology and is pleased to take radiograms for his neighbours at recognised fees satisfactory to all concerned. Unfortunately, few veterinary surgeons can afford an outlay of between two and three hundred pounds on a radiological apparatus, and one feels that if your valuable paper could give a few addresses in various parts of the country where local veterinary surgeons could take their cases, it would be a great boon to them and theirclients, and probably provide, incidentally, many interesting cases to record in your paper.—Yours faithfully, RICHARD SCOTT, M.R.C.V.S.

3 Union Street, Aberdeen.
14*th July*, 1924.

The Editor begs to acknowledge the receipt of the following:—

Communications from Messrs. C. Hartley, J. Clunies Ross, D. S. Rabagliati, Principal A. W. Whitehouse, Lt.-Col. T. D. Young and H. Gray.

Report of the Proceedings of the Fifth Pan-African Veterinary Congress.

Report for 1923 of the Government Veterinary Surgeon, Ceylon.

National Veterinary Medical Association of Great Britain and Ireland, Limited.

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